Exponential Modeling '0809

1) You invest $1,000 in an investment account that pays 6% APR compounded monthly.
   a) Write an equation to model this situation. Be sure to explain what each variable represents.

   b) ESTIMATE the time it would take for your investment to double WITOUT ACTUALLY CALCULATING IT. Be sure to explain your reasoning.

   c) Find the time for your money to double.

   d) How much will your investment be worth after 20 years?

2) A box of cereal today costs $4.50. Because of inflation, the price increases by 3.5% each year.

   a) Write an equation to model the growth in the price of the cereal. Make sure to define any variables you used.

   b) Use your equation to predict the price of the cereal three years from now.

   c) Use your equation to predict when the price will exceed $6.50

3) Write an equation for the relationship between x and y given the table. Then use your equation to complete the table.

X	Y
1	700
2	490
3	343
4	
5	

4) A pendulum is pulled back 80 centimeters horizontally from its resting position and then released. The maximum distance of the swings from the resting position is recorded for 5 minutes, and was recorded in the table below. Determine what the maximum distance from the resting position after 9 minutes will be. Also, determine how many minutes it would take for the maximum distance to be less than 5 centimeters.

Time (min)	0	1	2	3	4	5
Max distance (cm)	80	66	55	46	38	32

5) Toward the end of the year, to make room for next year's models, a car dealer may decide to drop prices on this year's models. Imagine that a car that has a sticker price of $20,000. The dealer lowers the price by 4% each week until the car sells.

a) What would be the price if the car didn't sell after 8 weeks?

b) Theoretically, could the price of the car ever be zero? Explain.

6) A bus company raises the prices of its tickets by 3.4% per year. In 2000, the price of a ticket from Dallas to New Orleans was $50.

a) Write an equation to find the price of the ticket for any given year? Define all your variables.

b) What would the price of the ticket be today? How much would a ticket have cost in the year 1990?